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Frullaniae were noted, probably because the scrub was not large enough to afford a foothold, and rotten-log species were rare, as in most European reports.

While it is perhaps hardly valuable, it may be interesting to compare the N. E. and Maine lists with some of the local north-European floras. Of the 216 species given in *Kaalaas*' Norwegian list, 111 are common to N. E., 89 to Maine, 91 to N. H. In Lindberg & Arnell's Siberian list, 96 species in all, 72 are common to N. E., 58 to Maine, 62 to N. H. In *Bernet*, Hėpatiques' de la Sud-ouest de la Suisse, 142 species in all, 87 are common to N. E., 70 to Maine, 78 to N. H. In *Macvicar*, Handbook of British Hepatics, 274 species in all, 128 are common to N. E., 102 to Maine, 104 to N. H.

It is fairer to compare the Sarekgebirge and Siberian lists with Maine, as they are records of single trips, while the other lists are those of carefully-explored countries. A beginning only has been made in Maine. It will be observed that in each case, more species are credited to N. H. than to Maine. This is no reflection upon the wealth of the Maine flora, but rather to her credit, that with so little systematic collecting, the list so nearly approaches that of N. H., which has been visited and revisited by every collector for decades, especially the Presidential Range.

The notes given above show the highly boreal character of the Round Mountain Lake region, and give hope for many further species which may await enrollment upon the N. E. list.

HARTFORD, CONN., May, 1913.

AN INTERESTING MOSS

H. S. JEWETT, M.D.

On Dec. 4, 1913, in the water, and upon the limestone walls of a spring, and its overflow brook, in Neff Park, Yellow Springs, Greene Co., Ohio, I found a number of mats of moss. The entire southwest section of Ohio has been denuded to the lower beds of the Upper Silurian epoch, hence the whole region rests on limestone, and all our water, whether river, creek, brook, or spring ,is strongly calcareous, and the forests are all deciduous.

Some of the moss mats were so far above the water in the spring that their water supply was derived entirely from rain and dew; these were all *Amblystegium filicinum* (L.) De Not. Seven or eight of the mats were growing on the stones at the waterline, extending four to ten inches upwards and three or more inches downwards into the water, and it is in these partly submerged mats that the interest centers. As all these mats proved to be alike in moss contents and arrangement, I shall divide them into three zones to make their description easy.

Zone 1 comprises all of the mats *below* the waterline; *i. e.* constantly submerged, including a few tufts growing on the bottom of the spring and having, apparently, no connection with the mats on the sides of the spring.

Zone 2, the portion, two or three inches wide, *just above* the waterline, which was kept saturated with water by capillary attraction.

Zone 3 includes all of the mats above zone 2.

I have studied fifty or more plants from each of zones 1 and 2, and many from zone 3, eliciting the following facts:

In zone 1 genetic buds are few, and I found no male buds, hence the moss is probably dioicous, but the inflorescence is not proven; and the plants of the var. *spinifolium* have few or no paraphyllia, while the plants of modified *filicinum* have many paraphyllia as in normal *filicinum.*

Zone 3 is *Amblystegium filicinum* (L.) De Not. in nearly pure culture, and, so far as I can find, *contains no Amblystegium irriguum* (Wils.) B. & S.

Zone 2 consists of *Amb. filicinum* in process of modification *towards var. spinifolium*, or, as named in Dixon and Jameson's Handbook, "var. *vallis-clausae.*" This is shown by the gradual darkening of the color, as the moss approaches the waterline, where it has become indistinguishable from the moss in zone 1, and by the leaves becoming narrower and slightly longer, thus becoming less deltoid, and more lanceolate in outline, and by the costa changing to percurrent or long excurrent. In zone 2 I also find many plants of var. *spinifolium,* a few of them being modified towards *Amb. irriguum*, but no normal *irriguum.*

Zone 1 consists almost entirely of the *variety spinifolium Schimp.*, mixed with occasional plants of the modified *filicinum* of zone 2; and I found one plant with a few leaves of apparently normal *irriguum*, while all the remaining leaves were var. *spinifolium.*

It is well known that both *Amb. filicinum* and *Amb. irriguum* produce a variety "*spinifolium*," and that these varieties resemble each other so closely that they can be separated only by the experts, and not always by them.

What is the moss in zone 1? *It is var. spinifolium*, but is it a derivative of *filicinum* or of *irriguum?*

I thought I had a clear case in favor of *filicinum*, as I found no normal *irriguum* in the region around the spring, while *filicinum* was common, and *all the mats growing in connection with the var. were filicinum.* The variety is also probably dioicous. The authorities all say that this var. of *filicinum* has few or no paraphyllia. The *filicinum* in zone 2 was undergoing modification *towards* the variety.

Two of our experts write me as follows:

Rev. H. Dupret, of Montreal, writes: "Both your Nos. 3413 and 3414 are a very interesting form of *irriguum*, the var. *spinifolium*, Schimp."

Dr. Grout writes more fully: "The moss above the spring is certainly *Amb. filicinum.* The moss in the water is to my mind certainly what Sullivant called *Amb. irriguum spinifolium.* The fact that they grow so closely associated proves nothing in itself. To my best judgment there is no doubt that your moss is *Hyp. irriguum* var. *spinifolium* of Amer. authors. . . . . *Irriguum* and *filicinum* are more closely related and their forms intergrade more, here in America, than has been realized by students of European mosses. I have repeatedly expressed my disbelief in the value of the arrangement of male and female buds on closely related mosses, particularly in the *Hypnaceae.* To sum up, I vote for *irriguum* because your plant has the habit, the leaf form and structure, and paraphyllia of *irriguum* rather than of *filicinum.* I believe these outweigh the contiguity of the forms and the inflorescence."

I have sent what I have of the variety to Dr. Grout for his Series of N. A. Musci Pleurocarpi, and shall accept his diagnosis; still the interesting question remains to be answered; how does it happen that *everyone of a number of mats of Amb. filicinum,* growing at the water's edge, is *continued below the water by Amb. irriguum var. spinifolium,* while a mat of *Entodon seductrix* growing in like situation on the wall of the same spring is not thus accompanied by the variety, nor could I find the variety growing independently of *filicinum?*

DAYTON, OHIO, 17 Jan., 1914.

HYPOPTERYGIUM JAPONICUM IN NORTH AMERICA

JOHN M. HOLZINGER

Professor A. S. Foster recently sent me a *Hypopterygium* collected by him "on rocks among boulders, at Egg Harbor, Coronation Island, southeastern Alaska, July 24, 1913". This moss was collected at the same place also by Dr. Frye. On examination, I found it to agree perfectly with *Hypopterygium japonicum* Mitt., sent me by Prof. H. Nakanashiki from two stations, and by Prof. Shutai Okamura from two other stations, all in Japan. Both these moss students had their plants determined by Dr. V. F. Brotherus, and both sent fruiting plants. The Egg Harbor plants are not fruiting, but show quite a few archegonial buds. On careful comparison of branch leaves, of ventral bracts, and of perichaetial leaves there is left no doubt about the identity of the Alaskan with the Japanese species. Several of the Japanese specimens are more luxuriant, and part of them show rather scant brown felt, which is quite pronounced on the Alaskan plants.

On submitting my findings to Mrs. Britton, she very kindly sent me a bit of the type of *Hypopterygium japonicum* Mitt., informing me at the same time that Prof. Foster had sent some of his plant to the New York Botanical Garden, and that both she and Mr. R. S. Williams had referred this to *H. canadense.* A comparison with Mitten's type still further strengthened my conviction that the Alaska plant is indeed *H. japonicum.*

Then the question arose: Is Dr. Kindberg's type really different, and a distinct species? Mrs. Britton here also kindly came to my assistance, and loaned me her material of *H. canadense* Kindb., comm. J. Macoun, as "type," and therefore, by inference (the label does not state locality) the very plant collected by Newcombe on Queen Charlotte Island off the coast of British Columbia in 1898, and communicated to Dr. Kindberg by Mr. John Macoun, the Botanist of the Dominion of Canada. The few plants in this pocket are somewhat smaller, and rather battered, but enable perfectly comparison of the several